CLAIMS

1. A system for printing images on a substrate, comprising:

a) a black ink-jet ink including:

i) a liquid vehicle including water, and from 15 wt% to 30 wt% organic solvent, wherein from 3 wt% to 10 wt% of the organic solvent is a methylated pentanetriol co-solvent, and

ii) from 1 wt% to 6 wt% of a dispersant-functionalized black carbon pigment; and

b) a printhead loaded with the black ink-jet ink which is configured to jet the black ink-jet ink at a firing frequency from 15 kHz to 25 kHz.

2. The system of claim 1, wherein the carbon pigment is from about 5 nm to about 10 μm in size.

3. The system of claim 1, wherein the liquid vehicle comprises from about 70 wt% to about 99 wt% of the ink-jet ink composition.

4. The system of claim 1, wherein, in addition to the methylated pentanetriol, the organic solvent includes at least two other organic co-solvents, each being present at from about 1 wt% to about 10 wt%.

5. The system of claim 1, further comprising from 0.001 wt% to 0.1 wt% surfactant.

6. The system of claim 1, wherein the composition is surfactant free.

7. The system of claim 1, further comprising from 0.1 wt% to 4 wt% of an ammonium salt.

8. The system of claim 1, wherein the methylated pentanetriol is 3-methyl-1,3,5-pentanetriol.

9. The system of claim 1, wherein a dispersant precursor used to form the dispersant-functionalized black carbon pigment is an amino precursor selected from the group consisting of para-aminobenzoic acids, isophthalic acids, and triacids.

10. The system of claim 1, wherein the firing frequency is from 18 kHz to 25 kHz.

11. A method of rapidly printing a black ink-jet image, comprising ink-jetting a black ink-jet ink onto a media substrate at a firing frequency from 15 kHz to 25 kHz, said black ink-jet ink comprising:

i) a liquid vehicle including water, and from 15 wt% to 30 wt% organic solvent, wherein from 3 wt% to 10 wt% of the organic solvent is a methylated pentanetriol co-solvent; and

ii) from 1 wt% to 6 wt% of a dispersant-functionalized black carbon pigment.

12. The method of claim 11, wherein the carbon pigment is from about 5 nm to about 10 μm in size.

13. The method of claim 11, wherein the liquid vehicle comprises from about 70 wt% to about 99 wt% of the ink-jet ink composition.

14. The method of claim 11, wherein, in addition to the methylated pentanetriol, the organic solvent includes at least two other organic co-solvents, each being present at from about 1 wt% to about 10 wt%.

15. The method of claim 11, further comprising from 0.001 wt% to 0.1 wt% surfactant.

16. The method of claim 11, wherein the composition is surfactant free.

17. The method of claim 11, further comprising from 0.1 wt% to 4 wt% of an ammonium salt.

18. The method of claim 11, wherein the methylated pentanetriol is 3-methyl-1,3,5-pentanetriol.

19. The method of claim 11, wherein a dispersant precursor used to form the dispersant-functionalized black carbon pigment is an amino precursor selected from the group consisting of para-aminobenzoic acids, isophthalic acids, and triacids.

20. The method of claim 11, wherein the firing frequency is from 18 kHz to 25 kHz.

21. An ink-jet ink composition, comprising:

a) a liquid vehicle having from 15 wt% to 30 wt% organic solvent, wherein from 3 wt% to 10 wt% of the organic solvent is 3-methyl-1,3,5-pentanetriol;

b) from 1 wt% to 6 wt% of a dispersant-functionalized black carbon pigment; and

c) from 0.1 wt% to 4 wt% of an ammonium salt.

22. The composition of claim 21, wherein the carbon pigment is from about 5 nm to about 10 μm in size.

23. The composition of claim 21, wherein the liquid vehicle comprises from about 70 wt% to about 99 wt% of the ink-jet ink composition.

24. The composition of claim 1, wherein, in addition to the methylated pentanetriol, the organic solvent includes at least two other organic co-solvents, each being present at from about 1 wt% to about 10 wt%.

25. The composition of claim 21, further comprising from 0.001 wt% to 0.1 wt% surfactant.

26. The composition of claim 21, wherein the composition is surfactant free.

27. The composition of claim 21, wherein the dispersant-functionalized carbon black is formed using a dispersant precursor selected from the group consisting of para-aminobenzoic acids, isophthalic acids, and triacids.